TDC

Theater Deployable Communications

Product Acceptance Test Procedure

for the
Crypto Module
CM

31 May 01

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1. Purpose

This document contains the detailed information required to perform the testing on the Basic Access Module (BAM) for the Theater Deployable Communications - Integrated Communications Access Packages (TDC-ICAP) for the United States Air Force. This test procedure serves to verify that the operational requirements are met.

2. Scope

This test procedure is to be used for Production Acceptance testing of the TDC-ICAP's BAM module. Acceptance of the module in accordance with this test procedure shall be sufficient to assure operability with other modules within the ICAP system.

3. References

The following is a list of documents applicable to this test procedure:

Document Number	Title
----------	CM Baseline Requirements Document, 31 May 01
MIL-STD-810E	Environmental Test Methods and Engineering Guidelines

4. DEFINITIONS AND ACRONYMS

The following definitions and acronyms are used in this document and/or other TDC-ICAP module test procedures:

BAM	Basic Access Module
BER	Bit Error Rate
BRI	Basic Rate Interface
CSU	Channel Service Unit
CTS	Clear to Send
DCS	Data Carrier Detect
DSR	Data Set Ready
DTR	Data Terminal Ready
DSVT	Digital Secure Voice Telephone
E&M	Ear and Mouth
EIA	Electronic Industries Association
ESD	Electro Static Discharge
ESS	Environmental Stress Screening
ICAP	Integrated Communications Access Packages
I/O DF	Input/Output Distribution Frame
IP	Internet Protocol
ISDN	Integrated Subscriber Digital Network
KGU	Known Good Unit
LAN	Local Area Network
LED	Light Emitting Diode
MSU	Modular Switching Unit

PC	Personal Computer
POTS	Plain Old Telephones
PPP	Point-to-Point Protocol
PRI	Primary Rate Interface
RIP	Routing Information Protocol
RTS	Request to Send
RX	Receive
SCN	Switched Circuit Network
SRAM	Static Random Access Memory
SLIP	Serial Line Internet Protocol
STU-III	Secure Terminal Unit - III
TDR	Test Data Record
TX	Transmit
TTC	Telecommunications Techniques Corporation
UUT	Unit Under Test

5. TEST EQUIPMENT REQUIRED

CAUTION
All equipment must display a current calibration or "Not Calibrated" sticker. The test equipment listed below, or equivalent, as determined by the test engineer will be required to perform this test procedure.

5.1 Common Test Equipment

Quantity	Model	Manufacturer	Description
1	6000A	Fireberd	Bit Error Tester, RS-530 Interface Module
1		Verilink	CSU/DSU
2	---		Test Computer – Pentium with 10/100 BaseT ethernet and modem card – referred to as PC1 and PC2 in this procedure.

5.2 Special Test Equipment

Not required.

6. RESPONSE TO TEST FAILURES

For all types of incidents noted below, the resolution process shall be:

On occurrence of each incident, the test personnel shall determine the next step in the process.

The decision may be to enter the troubleshooting mode wherein the operator shall determine the cause of the problem and recommend action to resolve it. If the incident is considered minor, the decision may be to proceed directly into the retest phase.

The function being tested when the incident occurred shall be re-tested three (3) times in succession. If all three re-tests are successful then the original failure will be considered an anomaly and so noted in the TDR and that paragraph of the ATP shall be considered passed. Results of all three re-tests shall be noted in the TDR and the ATP shall continue from this point.

If any of the re-tests fail, the test of that paragraph shall be considered failed and so marked in the TDR.

6.1 Failure of the UUT

Test failures shall be documented using the following procedures:

If failures occur, testing shall be halted and recorded on the TDR as a failure. The failure shall be recorded in the ORION System at the system level on the Test Discrepancy Report. The module shall then undergo troubleshooting to determine the cause of failure. Testing will not be complete until the cause of failure has been determined.

The Test Discrepancy Report will ensure that failures (hardware, software, or test equipment) are documented.

6.2 Failure of GFE

No GFE is required for testing.

6.3 Failure of Test Equipment

6.3.1 Test Hardware

Failed test equipment shall be repaired or replaced and testing shall proceed. All previously tested areas that are affected by the failed test equipment shall be re-tested and a test discrepancy report written.

6.3.2 Operator Error

If an anomaly occurs because of an operator error (e.g. incorrect command or out-of-sequence command) the operator shall return in the ATP to the previously passed test and restart the affected test. If the operator successfully performs the second test attempt, no failure shall be recorded and the balance of the tests shall be performed.

6.3.3 ATP Corrections

If while a test is being conducted, a problem is found with the approved test procedure, the following action shall be taken:

1. Should a typographical error be found or clarification needed that does not impact functionality, the test shall continue with the red-lined procedure.

2. If other than a typographical error is found or clarification needed, then test personnel shall determine the deviation, draft the appropriate change and present it to the government test representative for approval. If practical, the test personnel will continue to perform other parts of the test while waiting the representative's approval.

3. Should the change result from an error in the procedure, the government representative will be provided with a technical description indicating the reason for changing the procedure. The description shall be of sufficient detail to verify that the proposed change does not cause the equipment under test to not meet the specified requirements.

7. PREPARATION FOR TEST

7.1 Unit Under Test Protection

The Crypto Module contains parts that are static sensitive, however, when assembled as a module the unit is protected from potential damage. ESD protection is not required for normal operation.

When sub-assemblies are removed from the Crypto Module, appropriate ESD protection methods shall be used.

7.2 Environmental Conditions

All testing specified by this procedure shall be conducted under normal ambient conditions.

7.3 Initial Set-Up

Before testing perform the following steps or verify that they have been done.

Note: All testing will be done with 110 VAC 60Hz Prime Power Only.

7.3.1 UUT Set=Up

The following figure is given as a reference. The Crypto Module will not be fully connected as shown, but rather, various parts will be connected during testing.

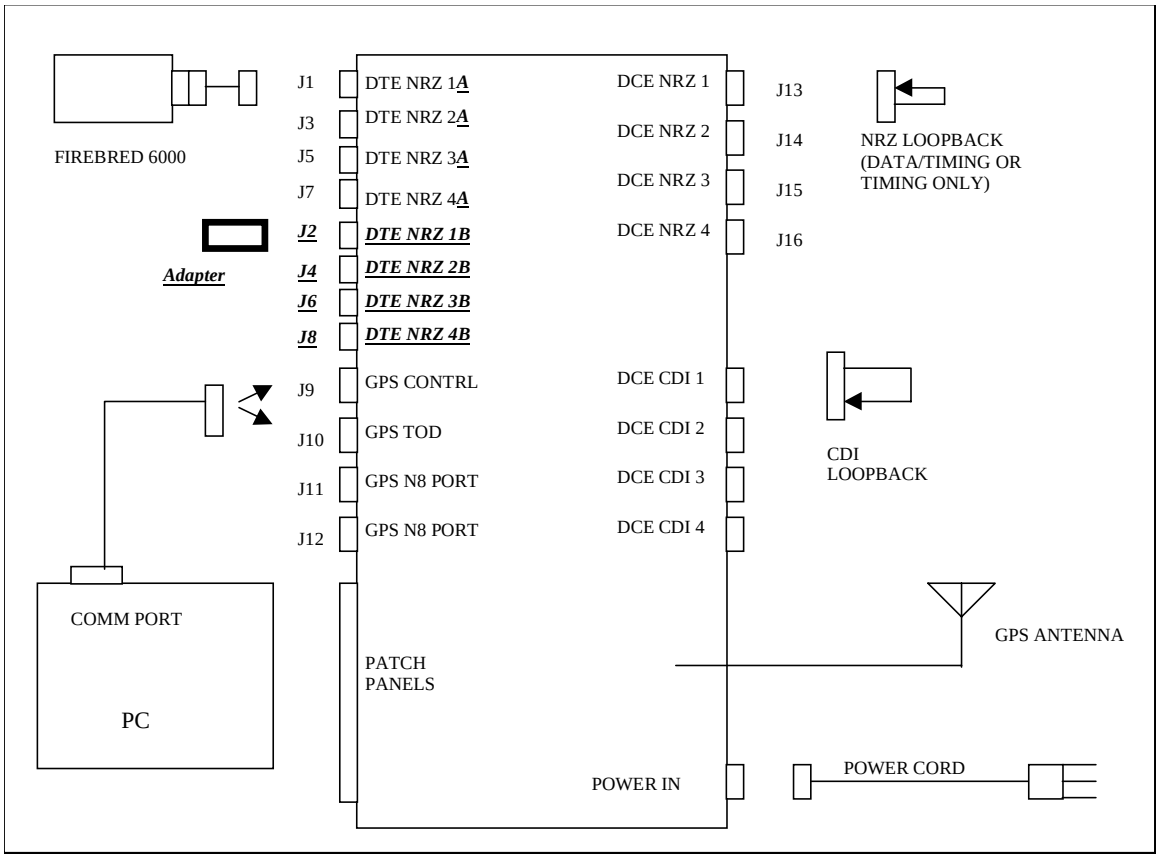

Figure 1 – Crypto Module Test Set up

8. TEST PROCEDURE

8.1 Test Description

Each of the eight DTE NRZ inputs (DTE 1-4 “A” & DTE 1-4 “B”) will be driven, in turn, from a FIREBERD 6000A data source. The data will be encrypted by one of four KIV-19s associated with that port. Prior to running the Bit Error Test, the encryption key must be loaded into the KIV-19 units by using a KYK-13 Fill Device. The Conditioned Di-phase outputs will be exercised using an external CSU/DSU device which will test the KIV-19 TED DTE (Black) interface. The DTE NRZ received data will be correlated to outgoing transmit data by the FIREBERD. Any discrepancies will be measured and displayed as a Bit Error Rate (BER). Each BER test is three minutes in duration. Each of the four channels will be tested at the data rates of 256K, 1152K and 2048 kHz. The GPS timing source must be on and functioning. Crypto re-sync testing will be accomplished on each of the four KIV-19s associated with each port.

The Primary Reference Source will be tested by accessing the Fault Monitor CPU and setting various modules during the testing of other components. Test the two N8 cards connected to the signal Entrance Panel (SEP) with a Firebird. Setup the Firebird as a DCE using Terminal

Timing. All GPS front panel alarms should be cleared and the status of the system (GPS lock) should be verified through the GPS TOD interface using F72.

The tests described in this section are stand alone tests. Therefore, the tests may be performed in any order at the discretion of the test operator. Where technically possible and if test equipment is available they may also be done in parallel. These steps are necessary to improve efficiency and reduce test cycle time.

8.2 Encryption and Decryption

1. Apply prime power to the CRYPTO MODULE, CV-2048's, and the KIV-19 rack adapters. The CV-2048's will display their software revision on power up. Note the software revision and enter it on the front of the TDR.

2. Verify GPS card strapping using Appendix A. Attach a GPS antenna to the "Antenna" input on the TrueTime shelf at the rear of the Crypto module. The red "Antenna Status" LED should extinguish. The left most disciplined oscillator in the shelf as viewed from the front of the Crypto module (the Rubidium) could take as much as several hours to lock. The unit to the right of the first one (the high stability) should lock in approximately 20 minutes. The first oscillator's fault light should normally be off. The second unit's fault light is normally green. All other fault lights should be off (see 8.2.2.1 if not).

3. On the back of the FIREBERD, find the EIA 530/MIL 188C DB25 pin connector. This connector is on the RS449 card, installed in one of the accessory slots. Cable from this connector to the DTE 1 A connector on the SEP at the rear of the CRYPTO MODULE using a straight through DB25 cable from the Crypto module's accessory kit (or DTE 2 A, etc. for the other channels).

4. Connect Baseband 2 Patch Panel TED 1 to the Baseband 2 Patch Panel DCE 1 (RIGHT SIDE, NOT LEFT SIDE; See figure 3) using a patch cable p/n PTWM-24-78 (stored in Pouch) as follows:

TED 1	DCE 1
DATA OUT	DATA IN
DATA IN	DATA OUT
TIM OUT	TIM IN
TIM IN	TIM OUT
BSC IN	SC OUT

5. Connect the output of the VERILINK CSU/DSU (timing source: internal Timing) to DCE 1 on the SEP at the rear of the CRYPTO MODULE (or DCE 2, etc. for the other channels).

6. If not already set up, Set the FIREBERD as follows:

    - On the front panel, select "INTF SETUP" using the "MENU" key.

- In the left window, select “MIL 449”. A new menu appears. Select “EIA 530”. Next, select “MODE”, then select “BAL” and “78” for the impedance.

- On the front panel, select “AUXILIARY” using the “MENU” key. Press “LIST” until “33 PRGM PATTERN” appears in the left window.

- Press “SELECT” and enter 01111111 (zero and seven ones) with the keypad. Press “INSERT”. Press the up arrow twice to return to the “AUXILIARY FUNCTIONS” menu.

- On the “GEN CLK” panel, select “INTF”.

- On the “DATA” panel, select “PRGM”.

- On the “ANALYSIS MODE” panel, select “CONTINUOUS”.

- On the “ANALYSIS RESULT” panel, select the following using both “CATEGORY” up/down arrows and both “RESULT” left/right arrows.

  LEFT CATEGORY: ERROR LEFT RESULT: BIT ERRORS
  RIGHT CATEGORY: SIGNAL RIGHT RESULT: RCV FREQ

- On the “EMULATE DTE” panel, press the RTS and DTR buttons “On”.

8.2.1 GPS N8 Frequency Setup

1. Connect the COM port of either Mobile Test Rack PC to GPS CONT. If Hyperterminal is not already set up under “Hyperterminal Properties” select:

   Settings/Emulation: VT100, Background Buffer Lines: 500, Phone Number: Direct to COM 2, Phone Number Config: Baud 9600, No Parity, One stop bit, Flow control: None, Settings/ASCII setup: check “Echo typed characters locally” and “Wrap lines that exceed terminal width”.

2. Type ‘V’ and “enter” to put the unit into VERBOSE mode.

3. To set the Data Rate for any N8 port:

   C##<SP>N<SP>rate, where “##” = card (slot) number; N = Output A, B, C, D, E, or F; Rate = frequency rate “8” through “2048”. For example, typing “C10 A 2048” sets card C10’s A output to 2048 kilobits/sec.

4. The N8 Frequency Synthesizers are located in slots 10 and 11.

5. Set N8 frequency Synthesizer in slot 10 port F to 64 kHz by typing “C10 F 64”, then to 256k and then return to 8k.

6. Set N8 Frequency Synthesizer in Slot 11 port F to 64 kHz by typing "C11 F 64", then to 256k and then return to 8k.

7. Verify that the message displayed indicates that the speed has changed as expected for steps 5 and 6.

8. Record the results in the TDR.

9. Type VER? and enter the software version for the TrueTime on the front of the TDR.

10. Set the N8 Frequency Synthesizer in Slot 10 and 11; Ports A through E to 2048 kHz.

11. To clear faults enter: PSRC=D. Next, enter SSRC=O (o for off). Next, enter PRI, (Principal) but only after the GPS is locked. Lastly, enter CL, this command will clear any fault that has been corrected. In the report display, these faults have a "+" sign in front of them. Faults will have to be cleared any time the unit has been powered down, or the GPS antenna has been removed. Know too, that the ARON command enables automatic reports.

8.2.2 CV-2048 Set-Up

Note: Setup must only be performed at initial test.

At the rear of the CV 2048's, connect the CDI XMT Red push-pins to the CDI RCV Black push-pins with a piece of wire for the unit under test. Connect the top to top and the bottom to bottom. Attach loopback devices to the Twinax (HOC) connectors on the rear of each unit under test. Note: rates above 64k will use the CX-11230 HOC.

CV-2048 #1	CV-2048 #2
CV-2048 #3	CV-2048 #4

FRONT VIEW NUMBERING OF CV-2048'S

CV-2048 SETUP#1: SETUP THE CHANNEL 1 CV-2048 AS FOLLOWS:

- USE THE **(UP/DOWN)** KEYS TO SCROLL THROUGH THE MENUS TO THE **CLOCK REFERENCE MENU** (CLK REF).
- USE THE **(LEFT/RIGHT)** KEYS TO SCROLL THROUGH THE MENU SELECTIONS TO **NRZ** AND PRESS **(ENTER)**.
- USE THE **(UP/DOWN)** KEYS TO SCROLL THROUGH THE MENUS TO THE **TRANSMIT CLOCK SOURCE** MENU (TXCLKSRC).
- USE THE **(LEFT/RIGHT)** KEYS TO SELECT **NRZ** AND PRESS (ENTER).
- USE THE **(UP/DOWN)** KEYS TO SCROLL THROUGH THE MENUS TO THE **RECEIVE CLOCK SOURCE** MENU (RXCLKSRC).
- USE THE **(LEFT/RIGHT)** KEYS TO SELECT **INT** AND PRESS (ENTER).
- USE THE (UP/DOWN) KEYS TO SELECT **RATE**. NEXT USE (LEFT/RIGHT) TO SELECT **2048** AND PRESS (ENTER).

- **THE LOOPBACK MODE SHOULD NOT BE SELECTED.**

8.2.3 KIV-19 Key Load and Operate

1. Turn the channel 1 KIV-19 on by pressing the **ON** button. The green **PWR ON** lamp should come on.

KIV-19 #1	Kiv-19 #2
Kiv-19 #3	Kiv-19 #4

FRONT VIEW NUMBERING OF KIV-19'S

2. Wait approximately 13 seconds for the red ALARM lamp to come on.

3. Press the KIV-19 SCROLL button to select the ZEROIZE function. Press the ACTUATE switch twice. The red ALARM lamp should go off momentarily.

4. Press the KIV-19 SCROLL switch to select the LOAD function.

5. Connect the KYK-13. Turn it on. Select the variable to be LOADED (POSITION 1 - 6).

6. Press the KIV-19 ACTUATE switch, watch for a blink of the red led on the KYK-13.

7. Verify that after approximately 5 seconds, the KIV-19 green PARITY lamp illuminates.

8. Turn the KYK-13 off and remove it from the KIV-19.

9. Press the KIV-19 SCROLL switch to select the CHNG KEY function. Press the ACTUATE switch. The red ALARM and green PARITY lamps should go off. The green RESYNC and yellow FULL OPR lamps should come on. The KIV-19 should now be fully operational.

10. Record the results in the TDR.

11. Repeat for the KIV-19's associated with channels 2,3 and 4.

    NOTE: The KIV-19 may have to be resynchronized for each new setup by scrolling to the "RESTART" function and pressing the "ACTUATE" switch.

8.2.4 Red DTE A NRZ to Black DCE NRZ (DTE A) and Phase Select

The following tests, 8.2.4 and 8.2.5, verify the KIV-19's transfer rate at 64 Kbps only.

1. Press the "RESTART" button on the FIREBERD. Verify no Bit Errors as follows:

   BIT ERRORS: 0
   SYNC: Green
   SYNC LOST: off

"Receive Frequency" will show 64000 +/- 2. This is the frequency of the external CSU/DSU.

2 On the SEP toggle the Phase Switch of the KIV-19 under test and note that the FIREBERD stays in sync but clocks BIT ERRORS for a moment as the Phase Switch is changed from position to position.

3. Record the results in the TDR.

8.2.5 RED DTE B to BLACK DCE NRZ (DTE B)

Connect the FIREBERD to the DTE1 B connector on the SEP at the rear of the CRYPTO Module using the EIA 530 to AN/FCC-100 adapter.

1. Press the RESTART button on the FIREBERD.

2. Verify no bit errors at the FIREBERD as follows:

BIT ERRS: 0
SYNC: GREEN
SYNC LOST: OFF

"Receive Frequency" will show 64000 +/- 2. This is the frequency of the external CSU/DSU.

3. Record the results in the TDR.

8.2.6 Red DTE NRZ to Black DCE CDI

1. Remove the Verilink CSU/DSU from the DCE 1 connector. Remove all jumpers from the Baseband 2 patch panel.

2. Connect the FIREBERD 6000A to the DTE 1 A connector on the SEP, with a straight through cable as in 8.2 (3).

3. Set the FIREBERD as follows:

DATA: 223-1
GEN CLK: INTF
TIMING MODE: SYNC

INTF SETUP:
As in paragraph 8.2, step 6 if needed.

4. Resynchronize the channel 1 KIV-19 by scrolling to the RESTART function and pressing the **ACTUATE** switch.

KIV-19 #1	Kiv-19 #2
kiv-19 #3	Kiv-19 #4

*NOTE: AT THIS POINT, THE KIV-19 GREEN **PWR ON**,* GREEN ***RESYNC*** *AND* YELLOW ***FULL OPR*** *LAMPS SHOULD BE ON.*

5. Press FIREBERD RESTART switch.

6. Verify no bit errors at the FIREBERD as follows:

BIT ERRS: 0
SYNC: GREEN
SYNC LOST:OFF

"Receive Frequency" will show 2048000 +/- 4. This is the frequency of the reference clock.

7. To check Crypto resync: remove the Twinex unbalanced loop being used. Scroll to Restart, Press actuate, check the TED to see if RESYNC LIGHT and the Full Opr light are out. Then re-attach the Twinex unbalanced loop. Scroll to Restart, Press actuate, check that the Resync light is now green, and Full Opr light is yellow.

Verify no bit errors at the FIREBERD as follows:

BIT ERRS: 0
SYNC: GREEN
SYNC LOST: OFF

"Receive Frequency" will show 2048000 +/- 4. This is the frequency of the reference clock.

8. **Record the results in the TDR.**

9. Repeat 8.2 for channels 2, 3 and 4 by changing the patch cables as needed for each channel. See figure 3 for patch locations for each channel. **Record the results in the TDR**.

Channel 2 Patches

NRZ	TED 2	DCE 2
	Data Out	Data In
	Data In	Data Out
	TIM OUT	TIM IN
	TIM IN	TIM OUT
	BSC IN	SC OUT

Channel 3 Patches

NRZ	TED 3	DCE 3
	DATA OUT	DATA IN
	DATA IN	DATA OUT
	TIM OUT	TIM IN
	TIM IN	TIM OUT
	BSC IN	SC OUT

Channel 4 Patches

NRZ	TED 4	DCE 4
	DATA OUT	DATA IN
	DATA IN	DATA OUT
	TIM OUT	TIM IN
	TIM IN	TIM OUT
	BSC IN	SC OUT

10. Repeat 8.2 for channels 1, 2, 3 and 4 by changing the patch cables as needed for each channel using the following CV-2048 setup.

CV-2048 SETUP#2: Setup the CV-2048 channels as follows:

- Use the **(Up/Down)** keys to scroll through the menus to the **Clock Reference Menu** (Clk Ref).
- Use the **(Left/Right)** keys to scroll through the menu selections to **INT** and press **(Enter).**
- Use the **(Up/Down)** keys to scroll through the menus to the **Transmit Clock Source** menu (TxClkSrc).
- Use the **(Left/Right)** keys to select **INT** and press **(Enter).**
- Use the **(Up/Down)** keys to scroll through the menus to the **Receive Clock Source** menu (RxClkSrc).
- Use the **(Left/Right)** keys to select **INT** and press **(Enter).**
- Use the **(Up/Down)** keys to select **Rate**. Next use **(Left/Right)** to select **2048** and press **(Enter).**
- **The Loopback mode SHOULD NOT be selected.**
- Using a patch cord connect the CV-2048 SC OUT to the TED BSC IN interface on the baseband patch panel.

11. Record the results in the TDR.

8.2.7 Primary Reference Source

1. Verify power is on the Primary Reference Source (PRS) (the entire “TrueTime” shelf).

2. Verify that the GPS antenna is connected by viewing the red Antenna Fault LED on the GPS card is OFF.

3. Verify that the timing outputs of the PRS are EIA-422. At the GPS1 SEP interface connector, pins 11 and 24 are the 64 Khz output. Pins 11 and 24 on the GPS 2 connector are 1 MHz.

4. Verify a Time of Day message is sent every second at RS-232 levels at the TOD connector, SEP J10, by monitoring the output on the PC using a terminal program.

5. Record the results of these verifications in the TDR.

APPENDIX A

Useful Information

Useful Information

CRYPTO MODULE GPS SWITCH SETTINGS

56000 DRC Chassis: 560-197-2

Fault Monitor Card (CPU): 560-5179-1 REV A

1.1.1.1.1.	1	OFF	**1.1.1.1.1.**	1	OFF
W1			**W3**		
	2	**ON**		2	OFF
	3	OFF		3	OFF
	4	OFF		4	OFF

1.1.1.1.1.1 CPU I/O (Rear): 560-5187-1S REV A
No switch settings required

GPS Receiver Card (Rear): 560-5202

Bottom Card:

1.1.1.1.1.	*1.1.1.1.1.3*	
W1	*ON*	
	2	OFF
	3	OFF
	4	OFF
	1.1.1.1.1.4	
	OFF	
	6	OFF
	7	OFF
	8	OFF

1.1.1.1.1.5 Power Supply Module: 560-5149-1
No switch settings required

1.1.1.1.1.6 Power Entry Module: 560-1222
No switch settings required

1.1.1.1.1.7 N8th Rear Card: 560-5141-3 REV 02
No switch settings required

N8th Card: 560-170 REV B

1.	**1.1.1.1.1.**	***1.1.1.1.1.5***	***1***	**1.1.1.1.1.6**	***1.1.1.1.1.7***
	W1	***OFF***		**W8**	***OFF***
		2 OFF			2 OFF
		3 OFF			3 OFF
		4 OFF			4 OFF
	1.1.1.1.1.	***1.1.1.1.1.9***	***1***	**1.1.1.1.1.10**	*1.1.1.1.1.11*
	W2	***OFF***		**W9**	*ON*
		1.1.1.1.1.12	*2*		2 OFF
		ON			
		3 OFF			3 OFF
		4 OFF			4 OFF
	SW3	***1.1.1.1.1.13***	***1***	*SW10*	*1.1.1.1.1.14*
		OFF			*ON*
		2 OFF			2 OFF
		3 OFF			3 OFF
		4 OFF			4 OFF
		1.1.1.1.1.15	***5***		
		OFF			
		6 OFF		*SW11*	***1.1.1.1.1.16***
					OFF
		7 OFF			1.1.1.1.1.16.1
					ON
		8 OFF			3 OFF
					4 OFF
	SW4	***1.1.1.1.1.17***	***1***		***1.1.1.1.1.18***
		OFF			***OFF***
		2 OFF			6 OFF
		3 OFF			7 OFF
		4 OFF			8 OFF
	SW5	***1.1.1.1.1.19***	***1***	*SW12*	*1.1.1.1.1.20*
		OFF			*ON*
		2 OFF			2 OFF
		3 OFF			3 OFF
		4 OFF			4 OFF
					1.1.1.1.1.21
					OFF
	SW6	*1.1.1.1.1.22*	*1*		6 OFF
		ON			
		2 OFF			7 OFF
		3 OFF			8 OFF
		4 OFF			
	SW7	*1.1.1.1.1.23*	*1*		
		ON			
		2 OFF			
		3 OFF			
		4 OFF			

CRYPTO Module GPS Switch Settings (conTINUED)

1.1.1.1.1.23.1.1 *Crystal Oscillator Card: (REF A) 560-5203-2 REV A* *Rb Oscillator Card: (REF B) 560-5203-3W*

Top Card:

1.1.1.1.1.2 W2	1 OFF			**1.1.1.1.1.2 W2**	1 OFF		
	2 OFF				2 OFF		
	3 OFF				3 OFF		
	1.1.1.1.1.25.1	4	ON		1.1.1.1.1.25.2	4	ON

Bottom Card:

1.1.1.1.1.2 W1	1.1.1.1.1.26.1	1	ON	**1.1.1.1.1.2 W1**	1.1.1.1.1.27.1	1	ON
	2 OFF				2 OFF		
	1.1.1.1.1.27.2	3	ON		1.1.1.1.1.27.3	3	ON
	1.1.1.1.1.27.4	**4**	**OFF**		1.1.1.1.1.27.5	4	ON
	1.1.1.1.1.27.6	**5**	**OFF**		1.1.1.1.1.27.7	5	ON
	1.1.1.1.1.27.8	6	ON		1.1.1.1.1.27.9	6	ON
	1.1.1.1.1.27.10	**7**	**OFF**		**1.1.1.1.1.27.11**	**7**	**OFF**
	1.1.1.1.1.27.12	**8**	**OFF**		**1.1.1.1.1.27.13**	**8**	**OFF**
	1.1.1.1.1.27.14				**1.1.1.1.1.27.15**		
1.1.1.1.1.2 W2	1.1.1.1.1.28.1	1	ON	**1.1.1.1.1.2 W2**	**1.1.1.1.1.29.1**	**1**	**OFF**
	2 OFF				1.1.1.1.1.29.2	2	ON
	1.1.1.1.1.29.3	3	ON		**1.1.1.1.1.29.4**	**3**	**OFF**
	1.1.1.1.1.29.5	**4**	**OFF**		**1.1.1.1.1.29.6**	**4**	**OFF**
	1.1.1.1.1.29.7	**5**	**OFF**		**1.1.1.1.1.29.8**	**5**	**OFF**
	1.1.1.1.1.29.9	**6**	**OFF**		**1.1.1.1.1.29.10**	**6**	**OFF**
	1.1.1.1.1.29.11	**7**	**OFF**		**1.1.1.1.1.29.12**	**7**	**OFF**
	1.1.1.1.1.29.13	8	ON		1.1.1.1.1.29.14	8	ON
	1.1.1.1.1.29.15				**1.1.1.1.1.29.16**		
1.1.1.1.1.3 W3	1.1.1.1.1.30.1	1	ON	**1.1.1.1.1.3 W3**	**1.1.1.1.1.31.1**	**1**	**OFF**
	2 OFF				2 OFF		
	1.1.1.1.1.31.2	**3**	**OFF**		**1.1.1.1.1.31.3**	**3**	**OFF**
	1.1.1.1.1.31.4	**4**	**OFF**		**1.1.1.1.1.31.5**	**4**	**OFF**
	1.1.1.1.1.31.6	**5**	**OFF**		**1.1.1.1.1.31.7**	**5**	**OFF**
	1.1.1.1.1.31.8	**6**	**OFF**		**1.1.1.1.1.31.9**	**6**	**OFF**
	1.1.1.1.1.31.10	**7**	**OFF**		**1.1.1.1.1.31.11**	**7**	**OFF**
	1.1.1.1.1.31.12	8	ON		1.1.1.1.1.31.13	8	ON

APPENDIX B

Crypto Module
Test Data Record

UUT/Test Information

UUT S/N _____

Test Operation Number _____

Date _____

Time _____

PARA	TEST NAME	PASS/FAIL
8.2.1 (8)	Channel 1: Freq. Synthesizers Set	P F
8.2.3(10)	Channel 1: KIV-19 Keyed	P F
8.2.4 (2)	Channel 1: Verify RED DTE A NRZ TO BLACK DCE NRZ (DTE A)	P F
8.2.5 (3)	Channel 1: Verify RED DTE B NRZ TO BLACK DCE NRZ (DTE B)	P F
8.2.6 (8)	Channel 1 RED DTE NRZ TO BLACK DCE CDI CV-2048 Setup #1	P F
8.2.6 (9)	Same as above for Channel 2	
	CV-2048 Setup #1	P F
8.2.6 (9)	Same as above for Channel 3	
	CV-2048 Setup #1	P F
8.2.6 (9)	Same as above for Channel 4	
	CV-2048 Setup #1	P F
8.2.6 (11)	Same as above for Channel 1	
	CV-2048 Setup #2	P F
8.2.6 (11)	Same as above for Channel 2	
	CV-2048 Setup #2	P F
8.2.6 (11)	Same as above for Channel 3	
	CV-2048 Setup #2	P F
8.2.6 (11)	Same as above for Channel 4	
	CV-2048 Setup #2	P F
8.2.7(5)	Primary Reference Source	P F

Validation Signatures

	Signature	**Date**	**Time**
Test Operator			
QA Witness			
Test Witness			